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HEADQUARTERS
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OFFICE OF THE ASSISTANT CHIEF OF STAFF FOR INTELLIGENCE
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REPORT ON DEVELOPMENTAL AND OPERATIONAL TECHNICAL CHARACTERISTICS OF THE HC-2 "HELL-BABY" HELICOPTER PRODUCED BY THE "OMNIPOL" of PRAGUE

The HELLBABY is the world's lightest two-seater helicopter. It has a three-propeller (blade) rotor with junctures at ..... It is driven by a "Boxer" motor, four cylinders, PRAGA DH, 83 PS, called the .....

DEVELOPMENT

The HELLBABY was planned on the basis of a simple and light-weight construction. An effort was made to ensure, at the same time, a measure of safety, flying quality, and performance similar to that obtained with the larger types.

Attention was devoted to keeping down noise as much as possible and to eliminate vibrations, under all flying conditions.

An effort was made to achieve helpful improvements by various means, as follows: ready accessibility and quick replacement of the most important of the parts and assemblies of the construction.

High quality aside from the system of assembly; facility of operation, and simple procedures for periodic check.

The HELLBABY is a new creation designed by a group of expert designers, the group that has already designed the PRAGA AIR BABY, a sport craft.

The new helicopter was built after ten years of research work, and passed through innumerable construction and technological tests. It has been operated with complete success since 1956.

This little helicopter with the PRAGA DH 83 HP motor bears the marking HC-2.

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A variant model, which bears the marking HC-102, is to be get a 100 HP motor, so as to be capable of meeting special flying requirements.

The operating conditions of the propulsion assembly can be alternated.

MODE OF EMPLOYMENT

The HELIBABY helicopter can be used for training purposes, for observation, and to carry mail, as well as for many other purposes.

It is particularly well adapted for basic training of helicopter pilots, in view of its highly resistant construction, its steering apparatus, its adequate stability, and its low cost per flying hour.

Emergency landings can be made, for practice purposes, without stopping the motor.

The HELIBABY has a low level of noise and vibration, and excellent freedom of vision.

Its small dimensions and the excellent piloting mechanism enable it to land and take off on very small areas, and at any moment.

In addition to the pilot, the HELIBABY can carry a photographer, a reporter, a geologist, and physician, and one more person if necessary. In all these circumstances the performance of the HELIBABY cannot be excelled, since in addition to the pilot it can carry a weight of 100 kg., using 22 liters of fuel per hour for every 100 km.

This helicopter can be shipped, over long distances, by railroad or by motor truck, because of its low weight and the easy removal of the blades.

Its simple, functional structure results in a low cost of purchase and operation, and guarantees a high yield. It also shortens the training time required for the mechanics. This is due to the fact that this helicopter does not have a complicated electric or hydraulic system.

The entire construction of the HELIBABY is such as to facilitate control and assistance from the ground.

TECHNICAL DESCRIPTION

THE BODY:

The body is of light metal construction and simple structure, of an

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aerodynamic shape that guarantees long duration ~~without~~ need for maintenance assistance.

The low floor of the cabin and the two large doors render access to the cabin quite comfortable. The ~~"podium"~~ canopy is made of plexiglass, in sections that can be replaced individually. The two seats, side by side one another, are ~~xxxxxx~~ adapted for parachutes. In front, ~~in~~ the middle of the cabin, there is a small instrument board. On both sides of the "Pylontrager" (pylon support~~er~~) there are large spaces for baggage, accessories, and special equipment.

ROTOR:

The roter has three blades of wood, encased in ..... laminated fibre glass wood and ~~glass~~ tissue.

The blades are attached to the head of the rotor by ~~junctions~~ joints ..... The head of the rotor is provided with ..... attachments, and its central ~~muting~~ damping device is designed after the manner of an attrition device. The centrifugal forces in the blade supports of the rotor are taken up by the torsion ~~stocks~~ bars, and the latter promptly transmit ewuivalent forces to the ~~steering gear~~ controls.

The rotor was designed with a view to its aerodynamic effectiveness, small maintenance requirements, and long life.

The ~~Stern Propeller~~ Tail Rotor:

The ~~stern propeller~~ Tail Rotor is made of separate ~~sheets of wooden plate~~ laminated wood covered over ~~with glass tissue~~ with fibre glass. A stream-lined covering protects the stern propeller during landings.

The Altitude ~~Guide~~: Horizontal Stabilizer

The ~~altitude guide~~ of light metal improves the flying ~~xxx~~ properties during rapid flight and during low auto-rotation flight.

The Piloting Arrangements:

The periodic and constant changes of ~~keel angle of the propeller are~~ plane of Rotation effected by means of a simple, but effective centrifugal mechanism, which has a hydraulic internal damper.

Inside the cabin are the following control levers:

-- ~~double piloting lever~~; dual controls

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-- two shift levers (stoppage) with gas cock on the left of the seats, and two pairs of pedals with lateral "ear," for shifting the angle of propeller adjustment ...

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The left piloting handle and the right one at the right for shifting the propeller can be easily disassembled.

An adjustable joint connecting the shift lever and the gas line makes it possible to maintain a steady number of revolutions during the take-off and the landing. The number of revolutions of the motor can be effectively control by means of the stopcock, regardless of the position of the right of the propeller-shift lever, so that an emergency landing can be made without stopping the motor.

Operation:

The Mode of wheel

The three- drive is provided with lowepressure hydraulic and pneumatic dampers.

The mobile stern wheel is provided with an intermediate-control spring.

The Descent Mechanism:

The motor activates the descent mechanism by means of a cardanic shaft. At the level of the .... there is connected up a free wheel to ensure auto-rotation of the rotor when the number of turns of the motor is reduced very quickly. The mechanism has a compressed-oil lubricating system of its own. The case of this mechanism is inserted in the sheet-metal construction of the pylon support by means of a series of rubber balls and a ball joint.

The starting of the end propeller is effected from the upper part of the case. A system of torsion shafts and cardanic joints leads to a small mechanism at the end of the shaft, which bears the end propeller and its shifting mechanism.

The Propulsion Mechanism:

The propulsion device consists of a four-cylinder Boxer motor PRAGA DH, 83 HP, 3,000 rev./min. An axial jacket on the crank shaft provides for effective cooling of the motor.

An automatic centrifugal friction coupling with ..... friction .... hooks engages

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the roter between 1300 and 1500 rev./min.

The motor with its guide sheets, its cooling jacket, and coupling forms a single assembly unit, and is put in position in the rubber mounts behind the roter pylon, at an angle of 45°, so that the space at the center of gravity is left open. [redacted]

A 9 l. oil tank is contained in the in the crankshaft housing ~~casing of the piloting~~ lever. The oil from the motor is cooled in a long aluminum tube that extends along the rear part of the crank case.

The 40 l. fuel tank is located inside the fuselage ~~body~~ beneath the center of gravity. The proportion of cold and warm air is regulated in front of the carburetor, from the cabin. The motor is started by a hand-operated crank.

The Equipment:

The basic equipment includes the following mechanisms: the "podium" (cupola) of transparent plexiglass, double dual controls ~~piloting~~ levers, the upholstery ~~stuffing~~ of the seats and a fire-extinguishing device.

With these installations go the following instruments:

-- a device to measure the load (power?);
-- a device to measure the speed;
-- a variometer; rate of climb indicator;
-- an altitude meter;
-- device to measure the double number of revolutions;
-- compass;

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-- fuel quantity gauge;
-- fuel pressure gauge;
-- ~~motor~~ oil pressure gauge;
-- ~~motor~~ oil thermometer; temperature gauge;
-- cylinder head temperature gauge;
-- suction air temperature gauge;
-- gauge for oil pressure in the mechanism;
-- temperature gauge for the oil of the mechanism.

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At the request of the user, Model HC 102 can also be provided with additional equipment, such as doors, heating for the cabin, electric net with 24 volt batteries, electric connection with ~~kkk~~ dynamo, instruments for blind flying, lighting for the cabin, etc.

CONSTRUCTION AND PERFORMANCE DATA (TYPE HC-2)

Total Measurements:

--	length	10.47 m.
--	width	7.90 m.
--	height	2.55 m.

Rotor:

--	diameter	8.80 m.
--	number of ~~propellers~~ ~~Vanes~~, blades	3
--	surface thickness	0.06
--	theoretical number of revolutions	285 rev./min.
--	maximum number of revolutions permissible	315 rev./min.

Rear Propeller

--	diameter	1.30 m.
--	number of blades	2
--	theoretical number of revolutions	1910 rev./min.

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Operation:

--	~~motor~~ engine	PRAGA DH
--	nominal output	83 HP in 300

Weight:

--	weight, empty	380 kg.
--	load	200 kg.
--	weight at the take-off	580 kg.

Performance Data:
(Total Weight: 580 kg.)

--	maximum top altitude, perpendicular	1100m.
--	" " " oblique	3100m.
--	lateral speed, oblique	3.6 m. sec.
--	" " horizontal flight	125 km./hr.
--	cruising speed	100 km./hr.
--	range of action (at cruising speed)	150 km.

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